

Interactive comment on “Composition, size distribution, optical properties and radiative effects of re-suspended local mineral dust of Rome area by individual-particle microanalysis and radiative transfer modelling” by A. Pietrodangelo et al.

Anonymous Referee #2

Received and published: 16 July 2015

The manuscript shows interesting results of measurements in an area little explored. Composition analysis was well done, combining different complementary methodologies. However, the authors made strong hypothesis without enough justification and thus the main conclusions are not as strong. Beside, manuscript english writing needs improving in some points.

Although the paper has potential interest for the ACP audience, I find it in need of major
C4967

changes. My concerns are:

- 1) Calibration of SEM XEDS are not shown nor referenced from another paper. Reliability is only accessed by comparison with EDXRF, for which the calibration was not shown/discussed as well. If they used NIST standard for calibration, or a different one, should be clarified.
- 2) PCA cannot be used for the proposed analysis because it allows negative mass/concentration. The reference method in case is PMF (positive matrix factorisation).
- 3) Discussion on size distribution is problematic because samples were produced in the lab. Authors did not mention, nor discussed if their method of resuspensions actually reproduce the same size distribution as would be measured in the atmosphere.
- 4) All the discussion / conclusion on the RT calculations are simple direct implications of the ADHOC index of refractions chosen from the literature.

Some specific suggestion to the authors follows bellow.

- a) Modify the abstract and introduction to better state what your work is about and why it is important
- b) Use Aeronet data for comparison. There are many years of data from Rome and from Laquila and you could select periods when dust concentration was expected to be high. From the inversion you will have not only the size distribution, but also the asymmetry parameter and single scattering albedo... and even the real and imaginary parts of the refractive index!
- c) Use transmission or reflectance methods in the lab to measure the resuspended material deposited on the filters. That will give you scattering and absorption directly.

In the attached manuscript I tried to identify all the typos and points were attention is needed.

Please also note the supplement to this comment:
<http://www.atmos-chem-phys-discuss.net/15/C4967/2015/acpd-15-C4967-2015-supplement.pdf>

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 13347, 2015.

C4969